

Claims

- [c1] 1.A combined current and voltage sensor for sensing current and voltage in a first load strap of a circuit breaker, the combined current and voltage sensor comprising:
- a combined sensor shell;
 - a current sensor located in said combined sensor shell, said current sensor disposed proximate to said first load strap; and
 - a first voltage sensor located in said combined sensor shell, said first voltage sensor disposed proximate to said first load strap.
- [c2] 2.The combined current and voltage sensor of claim 1, further comprising a second voltage sensor disposed proximate to a second load strap and a third voltage sensor disposed proximate to a third load strap.
- [c3] 3.The combined current and voltage sensor of claim 2, further comprising a configuration plug in electrical communication with said first voltage sensor, said second voltage sensor, and said third voltage sensor.
- [c4] 4.The combined current and voltage sensor of claim 3, wherein said configuration plug is in direct electrical connection with said voltage sensors and said voltage sensors is in direct electrical connection with said load straps.
- [c5] 5.The combined current and voltage sensor of claim 3, wherein said configuration plug is in direct electrical connection between said load straps and said voltage sensors.
- [c6] 6.The combined current and voltage sensor of claim 3, wherein said configuration plug configures said first voltage sensor, said second voltage sensor, and said third voltage sensor in a wye configuration with said first load strap, said second load strap, said third load strap, and a neutral line.
- [c7] 7.The combined current and voltage sensor of claim 3, wherein said configuration plug configures said first voltage sensor, said second voltage sensor, and said third voltage sensor in a delta configuration with said first load strap, said second load strap, said third load strap.

- [c8] 8.The combined current and voltage sensor of claim 1, further comprising an electronic trip unit disposed in said circuit breaker and in electrical communication with said first voltage sensor.
- [c9] 9.The combined current and voltage sensor of claim 1, wherein said first voltage sensor includes a transformer.
- [c10] 10.The combined current and voltage sensor of claim 1, wherein said first voltage sensor includes a voltage divider.
- [c11] 11.The combined current and voltage sensor of claim 10, wherein said voltage divider includes a first resistor in series with a second resistor.
- [c12] 12.The combined current and voltage sensor of claim 1, wherein said combined sensor shell is molded plastic.
- [c13] 13.A circuit breaker comprising:
a first load strap in electrical communication with an electronic trip unit;
a breaker in electrical communication with said electronic trip unit;
a current sensor disposed at said first load strap; and
a first voltage sensor disposed proximate said current sensor.
- [c14] 14.The circuit breaker of claim 13, further comprising a second voltage sensor disposed proximate to a second load strap and a third voltage sensor disposed proximate to a third load strap.
- [c15] 15.The circuit breaker of claim 14, further comprising a configuration plug in electrical communication with said first voltage sensor, said second voltage sensor, and said third voltage sensor.
- [c16] 16.The circuit breaker of claim 15, wherein said configuration plug is in direct electrical connection with said voltage sensors and said voltage sensors is in direct electrical connection with said load straps.
- [c17] 17.The circuit breaker of claim 15, wherein said configuration plug is in direct electrical connection between said load straps and said voltage sensors.
- [c18] 18.The circuit breaker of claim 15, wherein said configuration plug configures

said first voltage sensor, said second voltage sensor, and said third voltage sensor in a wye configuration with said first load strap, said second load strap, said third load strap, and a neutral line.

[c19] 19.The circuit breaker of claim 15, wherein said configuration plug configures said first voltage sensor, said second voltage sensor, and said third voltage sensor in a delta configuration with said first load strap, said second load strap, said third load strap.

[c20] 20.The circuit breaker of claim 13, wherein said current sensor and said first voltage sensor are housed in combined sensor shell.

[c21] 21.The circuit breaker of claim 13, wherein said first voltage sensor includes a transformer.

[c22] 22.The circuit breaker of claim 13, wherein said first voltage sensor includes a voltage divider.

[c23] 23.The circuit breaker of claim 22, wherein said voltage divider includes a first resistor in series with a second resistor.

[c24] 24.A circuit breaker comprising:
a first load strap in electrical communication with an electronic trip unit;
a breaker in electrical communication with said electronic trip unit;
a first voltage sensor disposed at said first load strap; and
a configuration plug in electrical communication with said first voltage sensor.

[c25] 25.The circuit breaker in claim 24, further comprising a second voltage sensor disposed proximate to a second load strap and a third voltage sensor disposed proximate to a third load strap.

[c26] 26.The circuit breaker of claim 25, wherein said configuration plug is in electrical communication with said second voltage sensor, and said third voltage sensor.

[c27] 27.The circuit breaker of claim 26, wherein said configuration plug is in direct electrical connection with said voltage sensors and said voltage sensors is in

direct electrical connection with said load straps.

[c28] 28.The circuit breaker of claim 26, wherein said configuration plug is in direct electrical connection between said load straps and said voltage sensors.

[c29] 29.The circuit breaker in claim 26, wherein said configuration plug configures said first voltage sensor, said second voltage sensor, and said third voltage sensor in a wye configuration with said first load strap, said second load strap, said third load strap, and a neutral line.

[c30] 30.The circuit breaker in claim 26, wherein said configuration plug configures said first voltage sensor, said second voltage sensor, and said third voltage sensor in a delta configuration with said first load strap, said second load strap, said third load strap.

[c31] 31.The circuit breaker in claim 24, wherein said first voltage sensor includes a transformer.

[c32] 32.The circuit breaker in claim 24, wherein said first voltage sensor includes a voltage divider.

[c33] 33.The circuit breaker in claim 32, wherein said voltage divider includes a first resistor in series with a second resistor.

[c34] 34.A method of sensing voltage in a circuit breaker, comprising:
sensing a first input voltage at a first load strap within said circuit breaker;
reducing said first input voltage at said first load strap;
generating an output voltage at said first load strap; and
sensing said output voltage at said first load strap relative to a reference point.

[c35] 35.A method of sensing voltage in claim 34, further comprising sensing a second input voltage at a second load strap and a third input voltage at a third load strap.

[c36] 36.A method of sensing voltage in claim 35, further comprising measuring said first input voltage, said second input voltage, and said third input voltage by a wye configuration relative to a neutral line.

[c37] 37.A method of sensing voltage in claim 35, further comprising measuring said first input voltage, said second input voltage, and said third input voltage by a delta configuration.

[c38] 38.A device for a circuit breaker comprising a configuration plug configuring a plurality of voltage sensors with a plurality of load straps as a delta configuration or a wye configuration.

[c39] 39.The device of claim 38, wherein said configuration plug is user placeable.

[c40] 40.The sensor of claim 38, wherein said configuration plug has a switch to select said wye configuration or said delta configuration.

[c41] 41.A circuit breaker comprising:
a plurality of load straps;
a plurality of voltage sensors disposed proximate to said load straps; and
a configuration plug in electrical communication with said voltage sensors, said configuration plug configuring said voltage sensors with said load straps as a delta configuration or a wye configuration.

[c42] 42.The circuit breaker of claim 41, wherein said configuration plug is user placeable.

[c43] 43.The sensor of claim 41, wherein said configuration plug has a switch to select said wye configuration or said delta configuration.

[c44] 44.A combined current and voltage sensor for sensing current and voltage in a plurality of load straps of a circuit breaker, the combined current and voltage sensor comprising:
a plurality of current sensors disposed proximate to load straps;
a plurality of voltage sensors disposed proximate to said current sensors and said load straps; and
a configuration plug in electrical communication with said voltage sensors, said configuration plug configuring said voltage sensors with said load straps as a delta configuration or a wye configuration.

[c45] 45.The sensor of claim 44, wherein said configuration plug is user placeable.

[c46]

46. The sensor of claim 44, wherein said configuration plug has a switch to select said wye configuration or said delta configuration.

44. The sensor of claim 43, wherein said configuration plug has a switch to select said wye configuration or said delta configuration.